

WHAT IS CLAIMED IS:

1 1. A system for repositioning teeth from an initial tooth arrangement
2 to a final tooth arrangement, said system comprising a plurality of dental incremental
3 position adjustment appliances including:

4 one or more appliances, each having a geometry selected to reposition the teeth
5 from a first arrangement to a second arrangement, wherein the appliances comprise
6 polymeric shells having cavities and wherein the cavities of successive shells have
7 different geometries shaped to receive and resiliently reposition teeth from the first to the
8 second arrangement; and

9 one or more wire and bracket systems to progressively reposition the teeth
10 from one arrangement to a successive arrangement, the wire and bracket systems and
11 appliances being deployed in seriatim to reposition teeth from the initial tooth
12 arrangement to the final tooth arrangement.

1 2. A system as in claim 1, wherein the tooth positions defined by the
2 cavities in each successive appliance differ from those defined by the prior appliance by
3 no more than 2 mm.

1 3. A system as in claim 1, comprising at least two intermediate
2 appliances.

1 4. A system as in claim 3, comprising at least ten intermediate
2 appliances.

1 5. A system as in claim 4, comprising at least twenty-five
2 intermediate appliances.

1 6. A method for repositioning teeth from an initial tooth arrangement
2 to a final tooth arrangement, said method comprising the following steps performed in a
3 preselected order:

4 successively placing three or more appliances having geometries selected
5 to progressively reposition the teeth from a first arrangement to successive arrangements;
6 and

7 placing one or more wire and bracket systems to progressively reposition
8 the teeth from one arrangement to a successive arrangement, the brackets and appliances

9 being deployed in seriatim to reposition teeth from the initial tooth arrangement to the
10 final tooth arrangement.

1 7. A method as in claim 6, where the tooth positions defined by the
2 cavities in each successive appliance differ from those defined by the prior appliance by
3 no more than 2 mm.

1 8. A method as in claim 6, wherein the successively placing step
2 comprises placing at least two additional appliances prior to placing the final appliance.

1 9. A method as in claim 8, wherein the successively placing step
2 comprises placing at least ten additional appliances.

1 10. A method as in claim 9, wherein the successively placing step
2 comprises placing at least twenty-five additional appliances.

1 11. A method as in claim 6, wherein the appliances are successively
2 replaced at an interval in the range from 2 days to 20 days.

1 12. An improved method for repositioning teeth using appliances
2 comprising polymeric shells having cavities shaped to receive and resiliently reposition
3 teeth to produce a final tooth arrangement, wherein the improvement comprises
4 determining at the outset of treatment geometries for at least three appliances to be used
5 in combination with at least one wire and bracket system, the appliances are to be worn
6 successively by a patient to reposition teeth from an initial tooth arrangement to the final
7 tooth arrangement, wherein the cavities of successive shells have different geometries.

1 13. An improved method as in claim 12, wherein at least four
2 geometries determined at the outset.

1 14. An improved method as in claim 13, wherein at least ten
2 geometries are determined at the outset.

1 15. An improved method as in claim 14, wherein at least twenty-five
2 geometries are determined at the outset.

1 16. An improved method as in claim 12, wherein the tooth positions
2 defined by the cavities in each successive appliance differ from those defined by the prior
3 appliance by no more than 2 mm.

1 17. A method as in claim 16, comprising at least two intermediate
2 appliances.

1 18. A method as in claim 17, comprising at least ten intermediate
2 appliances.

1 19. A method as in claim 18, comprising at least twenty-five
2 intermediate appliances.

1 20. An improved method for repositioning teeth using appliances
2 comprising polymeric shells having cavities shaped to receive and resiliently reposition
3 teeth to produce a final tooth arrangement, wherein the at least three appliances are
4 applied successively to a patient's teeth to reposition the teeth, wherein the improvement
5 comprises repositioning the teeth using a wire and bracket system to initially reposition
6 the teeth prior to applying the polymeric shell appliances.

1 21. An improved method as in claim 20, wherein at least four
2 appliances are applied to the teeth.

1 22. An improved method as in claim 21, wherein at least ten appliances
2 are applied to the teeth.

1 23. An improved method as in claim 22, wherein at least twenty-five
2 appliances are applied to the teeth.

1 24. An improved method as in any of claims 20-23, wherein initially
2 repositioning the teeth using a wire and bracket system configures the teeth to render
3 them amenable to treatment with polymeric appliances.

1 25. An improvement as in claim 24, wherein initially repositioning the
2 teeth alleviates at least one of the following conditions:

3 A-P correction of greater than 2 mm;
4 autorotation of the mandible required for vertical/A-P correction;

5 CR-CO discrepancy correction/treatment to other than centric occlusion;
6 correction of moderate to severe rotations of premolars and/or canines
7 that are greater than 20 degrees;
8 severe deep bite opened to ideal or open bite to be closed to ideal;
9 extrusion of teeth greater than 1 mm other than as part of torquing or in
10 conjunction with intruding adjacent teeth;
11 teeth tipped by more than 45 degrees;
12 multiple missing teeth;
13 crowns less than 70% of normal size;
14 posterior open bite; and
15 movement of entire arch required for A-P correction.

1 26. A method for treating a dental malocclusion, said method
2 comprising:
3 providing criteria to distinguish between a less severe malocclusion and a
4 more severe malocclusion;
5 determining whether an individual patient's malocclusion is more severe
6 or less severe according to the criteria;
7 if the malocclusion is determined to be less severe, treating the patient
8 with a plurality of successive polymeric shell appliances having different geometries
9 selected to resiliently reposition teeth to a final desired arrangement; and
10 if the malocclusion is determined to be more severe, treating the patient
11 successively in a predetermined order with (a) at least one wire and bracket system, and
12 (b) a plurality of successive polymeric shell appliances having different geometries
13 selected to resiliently reposition teeth, wherein the combined treatment repositions the
14 teeth to a final desired arrangement.

1 27. A method as in claim 26, wherein the criteria which are
2 characteristic of a more severe malocclusion include at least some of the following:
3 A-P correction of greater than 2 mm;
4 autorotation of the mandible required for vertical/A-P correction;
5 CR-CO discrepancy correction/treatment to other than centric occlusion;
6 correction of moderate to severe rotations of premolars and/or canines
7 that are greater than 20 degrees;

8 severe deep bite opened to ideal or open bite to be closed to ideal;
9 extrusion of teeth greater than 1 mm other than as part of torquing or in
10 conjunction with intruding adjacent teeth;
11 teeth tipped by more than 45 degrees;
12 multiple missing teeth;
13 crowns less than 70% of normal size;
14 posterior open bite; and
15 movement of entire arch required for A-P correction.

1 28. A method as in claim 27, wherein the absence of some or all of the
2 criteria characteristic of a severe malocclusion indicates that it is a less severe occlusion.

1 29. A method as in any of claims 26-28, wherein providing criteria
2 comprises providing a list of criteria.

30. A method as in claim 26, wherein determining whether the malocclusion is more or less severe comprises obtaining a model of the patient's teeth.

31. A method as in claim 30, wherein the model is a cast.

1 32. A method as in claim 30, wherein the model is digital.

1 34. A method as in claim 26, wherein the predetermined order is to
2 treat the patient's teeth first with the wire and bracket system to partially reposition the
3 teeth until the malocclusion is less severe according to the criteria and then treating the
4 patient with the polymeric shell appliances.

1 35. A method as in claim 26, wherein the predetermined order is to
2 treat the patient's teeth first with the polymeric shell appliances and then with the wire
3 and bracket system.

1 36. A method as in claim 26, wherein treating the patient with a
2 plurality of successive polymeric shell appliances comprises successively placing at least
3 three appliances each over a time period in the range from one to four weeks.

1 37. A method as in claim 36, wherein at least ten successive polymeric
2 appliances are placed.

1 38. A method as in claim 36, wherein at least twenty-five successive
2 polymeric appliances are placed.